

What Is Claimed Is:

1. A flexible reinforcement member for a communications cable comprising:

a plurality of high modulus fibers;

a primary saturant coupled to said plurality of high modulus fibers, said primary saturant having a melting point below approximately 300 degrees Celsius and a melt viscosity of less than approximately 1000 centipoise; and

a higher molecular weight, water-swellaable polymer topcoat coupled to said primary saturant.

2. The flexible reinforcement member of claim 1, wherein said primary saturant has a melting point between about 100 to about 150 degrees Celsius and a melt viscosity of less than 500 centipoise.

3. The flexible reinforcement member of claim 1, wherein said plurality of high modulus fibers comprises a plurality of sized high modulus fibers selected from the group consisting of a plurality of sized or unsized aramid fibers and a plurality of sized or unsized poly(p-phenylene-2,6-benzobisoxazole) (PBO) fibers and a plurality of sized or unsized carbon fibers and a plurality of sized or unsized high silica glass fibers and sized or unsized high tenacity, linearized polyethylene fiber.

4. The flexible reinforcement member of claim 1, wherein said plurality of high modulus fibers comprises a plurality of glass fiber strands.

5. The flexible reinforcement member of claim 4, wherein said plurality of glass fiber strands comprises at least one glass fiber bundle, each of said at least one glass fiber bundle comprising a plurality of glass fiber filaments.

6. The flexible reinforcement member of claim 2, wherein said plurality of glass fiber strands comprises a plurality of glass fiber filaments and at least one glass fiber bundle, each of said at least one glass fiber bundle comprising a plurality of glass fiber filaments.

7. The flexible reinforcement member of claim 1, wherein said primary saturant comprises a low molecular weight mineral wax.

8. The flexible reinforcement member of claim 7, wherein said low molecular weight mineral wax is selected from the group consisting of a low molecular weight microcrystalline wax, a low molecular weight polyalphaolefin wax, a low molecular weight polyethylene wax, or a modified (oxidized or maleated) polyolefin such as polyethylene or polypropylene, and blends thereof.

9. The flexible reinforcement member of claim 1, wherein said primary saturant comprises a blend of a low molecular weight microcrystalline wax and a styrene butadiene rubber, wherein said blend is between approximately 0.1 and 99.9 percent by weight of said low molecular weight microcrystalline wax and

between approximately 0.1 and 99.9 percent by weight of said styrene butadiene rubber.

10. The flexible reinforcement of claim 9, wherein said blend comprises a 50/50 by weight blend of said low molecular weight microcrystalline wax and said styrene butadiene rubber.

11. The flexible reinforcement member of claim 4, wherein said plurality of glass fiber strands comprises a plurality of sized glass fiber strands selected from the group consisting of a plurality of sized or unsized E-type glass fiber strands and a plurality of sized or unsized ECR-type glass fibers.

12. The flexible reinforcement member of claim 1, wherein said primary saturant comprises approximately 0.1 and 35 percent of the total weight of said flexible reinforcement member and wherein said high molecular weight water-swellaable polymer topcoat comprises between approximately 0.1 and 35 percent of the total weight of said flexible reinforcement member.

13. The flexible reinforcement member of claim 12, wherein said primary saturant comprises approximately 5 and 20 percent of the total weight of said flexible reinforcement member and wherein said high molecular weight water-swellaable polymer topcoat comprises between approximately 5 and 20 percent of the total weight of said flexible reinforcement member.

14. The flexible reinforcement member of claim 12, wherein said primary saturant comprises approximately 10 and 15 percent of the total weight of said flexible reinforcement member and wherein said high molecular weight water-swellaable polymer topcoat comprises between approximately 10 and 15 percent of the total weight of said flexible reinforcement member.

15. The flexible reinforcement member of claim 1, wherein said high molecular weight water-swellaable polymer topcoat is selected from the group consisting of ethylene vinyl acetate (EVA) polymers, block copolymers of polybutylene terephthalate, copolymers of long chain polyether glycols, thermoplastic elastomers, olefins, urethanes, polypropylene, polyethylene, polyurethane, low molecular weight mineral wax, polyacrylamides and blends thereof.

16. The flexible reinforcement of claim 15, wherein the glass transition temperature (T_g) of said flexible reinforcement is greater than about 40°C.

17. The flexible reinforcement member of claim 12, wherein said high molecular weight water-swellaable polymer topcoat comprises an ethylene vinyl acetate polymer topcoat.

18. The flexible reinforcement member of claim 1, wherein said high molecular weight water-swellaable

topcoat is a blend of water-swellaable polymer topcoat and non water-swellaable topcoat.

19. The flexible reinforcement member of claim 18, wherein the water absorbency for the reinforcement member is between about 111 to about 142 percent by weight.

20. A method for forming a flexible reinforcement member for use in a communications cable, the method comprising:

providing a high modulus fiber material, said fiber material selected from the group consisting of a plurality of sized or unsized aramid fibers and a plurality of sized or unsized poly(p-phenylene-2,6-benzobisoxazole) (PBO) fibers, sized or unsized carbon fibers or sized or unsized high tenacity, linearized polyethylene fiber, and a plurality of sized or unsized high silica glass fibers;

coating said fiber material with a low molecular weight primary saturant, said low molecular weight primary saturant having a melting point below approximately 300 degrees Celsius and a melt viscosity of less than approximately 1000 centipoise, wherein the weight of said low molecular weight primary saturant on said fiber material comprises between 0.1 and 35 percent of the flexible reinforcement member;

coating said fiber material with a higher molecular weight water-swellaable polymer topcoat.

21. The method of claim 20, wherein introducing a low molecular weight primary saturant to an application device comprises introducing a low molecular weight primary saturant to an application device, said low molecular weight primary saturant comprising a blend of a low molecular weight microcrystalline wax and a styrene butadiene rubber material, wherein said blend is between approximately 0.1 and 99.9 percent by weight of said low molecular weight microcrystalline wax and between approximately 0.1 and 99.9 percent by weight of said styrene butadiene rubber.

22. The method of claim 21, wherein introducing a low molecular weight primary saturant to an application device comprises introducing a low molecular weight primary saturant to an immersion bath.

23. The method of claim 20, further comprising introducing a high molecular weight water-swellingable, polymer topcoat onto said low molecular weight primary saturant.

24. The method of claim 21, wherein introducing said fiber material to said application device and introducing a high molecular weight polymer topcoat onto said primary saturant comprises:
introducing a low molecular weight primary saturant to a first application device;
melting said low molecular weight primary saturant within said first application device at a temperature sufficient to maintain said low molecular

weight primary saturant at a viscosity of less than about 1000 centipoise;

introducing said fiber material to said first application device to coat said low molecular weight primary saturant onto said fiber material to form a coated member;

removing said coated member from said first application device;

introducing said coated member to a stripper die to remove an excess of said low molecular weight primary saturant from said fiber material;

introducing said coated member to a high molecular weight water-swellable topcoat material contained within second application device to form a topcoated member;

removing said topcoated member from said second application device;

introducing said topcoated member to a second stripper die to remove an excess of said high molecular weight topcoat material from said topcoated member; and

cooling said topcoated member to form the flexible reinforcement member, wherein the weight of said low molecular weight primary saturant on said fiber material comprises between 10 and 35 percent of the flexible reinforcement member and wherein the weight of said high molecular topcoat material comprises between approximately 1 and 25 percent of the flexible reinforcement member.

25. The method of claim 20, wherein introducing a low molecular weight primary saturant

to a first application device and introducing said coated member to a high molecular weight water-swellaable topcoated member contained within a second application device comprises:

introducing a low molecular weight primary saturant to first application device, said primary saturant comprising a low molecular weight mineral wax selected from the group consisting of a low molecular weight microcrystalline wax, a low molecular weight polyalphaolefin wax, a low molecular weight polyethylene wax, a low molecular weight polyethylene wax, a low molecular weight maleated polypropylene polymer and blends thereof; and

introducing said coated member to a high molecular weight water-swellaable topcoat material contained within second application device to form a topcoated member, said high molecular weight topcoated material selected from the group consisting of ethylene vinyl acetate (EVA) polymers, block copolymers of polybutylene terephthalate, copolymers of long chain polyether glycols, thermoplastic elastomers, olefins, urethanes, polypropylene, polyethylene, polyurethane, low molecular weight mineral wax, polyacrylamides and blends thereof.

26. A method for forming a flexible reinforcement member for use in a communications cable, the method comprising:

providing a high modulus fiber material, said fiber material selected from the group consisting of a plurality of sized or unsized aramid fibers and a plurality of sized or unsized poly(p-phenylene-2,6-benzobisoxazole) (PBO) fibers, sized or unsized carbon fibers or sized or unsized high tenacity, linearized polyethylene fiber, and a plurality of sized or unsized high silica glass fibers wherein said high modulus fiber material is pre-coated with a higher molecular weight water-swellaable polymer topcoat; and

coating said fiber material with a low molecular weight primary saturant, said low molecular weight primary saturant having a melting point below approximately 300 degrees Celsius and a melt viscosity of less than approximately 1000 centipoise, wherein the weight of said low molecular weight primary saturant on said fiber material comprises between 0.1 and 35 percent of the flexible reinforcement member.

27. The method of claim 26, wherein introducing a low molecular weight primary saturant to an application device comprises introducing a low molecular weight primary saturant to an application device, said low molecular weight primary saturant comprising a blend of a low molecular weight microcrystalline wax and a styrene butadiene rubber material, wherein said blend is between approximately

0.1 and 99.9 percent by weight of said low molecular weight microcrystalline wax and between approximately 0.1 and 99.9 percent by weight of said styrene butadiene rubber.

28. The method of claim 27, wherein introducing a low molecular weight primary saturant to an application device comprises introducing a low molecular weight primary saturant to an immersion bath.

29. The method of claim 28, wherein the water absorbency for the reinforcement member is between about 349 to about 438 percent by weight.

30. The method of claim 28, wherein said high modulus fiber material is pre-coated with a high molecular weight, water-swellaable polymer topcoat selected from the group consisting of ethylene vinyl acetate (EVA) polymers, block copolymers of polybutylene terephthalate, copolymers of long chain polyether glycols, thermoplastic elastomers, olefins, urethanes, polypropylene, polyethylene, polyurethane, low molecular weight mineral wax, polyacrylamides and blends thereof.